

Notice of Allowability

Application No.

10/721,751

Examiner

Marc A. Scharich

Applicant(s)

SHIINA ET AL.

Art Unit

3611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/28/2006.
2. ☒ The allowed claim(s) is/are 1, 3-10, 12-15, 17-18, and 20-32.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with attorney James E. Howard on 2/22/2007. *The application has been amended as follows:*

Amendments to the Claims

Claim 3 is *amended to*:

-- Claim 3. The ~~electric power steering~~ apparatus according to claim 1, wherein the driving gear comprises a worm, the driven gear comprises a worm wheel, and a shaft center of the worm is offset in an axial direction of the worm wheel by a predetermined offset amount. --

Claim 9 is *amended to*:

-- Claim 9. The apparatus of claim 8, wherein ~~when~~ the pitch circle diameter ranges from about 80 millimeters to about 100 millimeters and wherein the amount of change in said gearing angle RA per arc-minute of backlash Δ RA comprises a range of about 22 micrometers to about 28 micrometers. --

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Claim 12 is *amended to*:

-- Claim 12. An electric power steering apparatus adapted to transmit power supplied from an electric motor for assisting steering, the electric power steering apparatus comprising: a driving gear and a driven gear through which the power is transmitted, wherein a first backlash between the driving gear and the driven gear in a first range of steering angles including a steering neutral position is smaller than a second backlash in a second range of steering angles, and wherein at least one of said driven gear and said driving gear comprises a bias portion that sets said first backlash, and wherein said bias portion is provided on an outer peripheral portion of ~~the~~ teeth of ~~said~~ the at least one of said driving gear and said driven gear. --

Claim 20 is *amended to*:

-- Claim 20. A power steering apparatus comprising: a driving gear; and a driven gear engaging the driving gear such that a first backlash between the driving gear and the driven gear is smaller in a first range of steering angles than a second backlash in a second range of steering angles, wherein at least one of said driven gear and said driving gear comprises a bias portion that corresponds to said first range of steering angles, and wherein said bias portion is provided on an outer peripheral portion of the teeth on ~~said~~ the at least one of said driving gear and said driven gear. --

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Claim 30 is *amended to*:

-- Claim 30. The apparatus of claim 29, wherein ~~when~~ the pitch circle diameter ranges from about 80 millimeters to about 100 millimeters and wherein the amount of change in said gearing angle RA per arc-minute of backlash Δ RA comprises a range of about 22 micrometers to about 28 micrometers. --

The following is an examiner's statement of reasons for allowance

Independent claims 1,8,12,20, and 29 contain the limitations of having first and second backlashes in first and second steering angle ranges, and further wherein the first backlash is *smaller* than the second backlash. Prior art does not appear to specifically disclose, or teach a motivation for having *a first backlash smaller than a second backlash in first and second steering angle ranges*.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc A. Scharich whose telephone number is (571) 272-3244. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lesley Morris can be reached on (571) 272-6651. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M.A.S. – 2/22/2007



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